

# Beginning Algebra

## Practice Test 1

A. Simplify each expression

$$1) \underbrace{6x}_{\uparrow} - 3y + \underbrace{4x}_{\uparrow} = 10x - 3y$$

$$2) 5(x + 4) = 5x + 20$$

$$3) 7(2x + 3y - 2) = 14x + 21y - 14$$

$$4) -1(5 + 7) = -15 - 7 = -5 - 7$$

$$5) 25 - 1(5 + 7) = 25 - 15 - 7 = 5 - 7$$

B. Solve each equation

$$6) -12 = -x + 7$$

$$\quad -7 \quad \quad -7$$

$$\quad -19 = -x$$

$$\quad \underline{-1} \quad \quad \underline{-1}$$

$$\boxed{19 = x} \text{ or } \boxed{x = 19}$$

$$7) \frac{5}{8} \left( \frac{8}{5} \right) x = \left( \frac{-24}{1} \right) \cdot \frac{5}{8}$$

$$x = (-3)(5)$$

$$\boxed{x = -15}$$

$$8) \frac{2}{8} \cdot x = 8$$

$$\frac{\cancel{8}}{2} \cdot \frac{\cancel{2}}{\cancel{8}} x = \frac{\cancel{8}^4}{1} \cdot \frac{3}{2}$$

$$\boxed{x = 12}$$

$$9) 2x - 4 = -3x + 1 - 6$$

$$2x - 4 = -3x - 5$$

$$+4 \qquad +4$$

$$2x = -3x - 1$$

$$+3x \qquad +3x$$

$$5x = -1$$

$$\frac{5x}{5} = \frac{-1}{5}$$

$$\boxed{x = -\frac{1}{5}}$$

$$10) 8(2t + 1) = 4(7t + 7)$$

$$16t + 8 = 28t + 28$$

$$-28t \qquad -28t$$

$$-12t + 8 = 28$$

$$-8 \qquad -8$$

$$-12t = 20 \div 4$$

$$-12 \qquad -12 \div 4$$

$$t = \frac{20}{-12}$$

$$= \boxed{-\frac{5}{3}}$$

$$11) \quad 5(x-7) = 3(x-2) + 2x$$

$$5x - 35 = 3x - 6 + 2x$$

$$\begin{array}{r} 5x - 35 = 5x - 6 \\ -5x \quad -5x \end{array}$$

$-35 = -6$  False statement

Contradiction Equation

$$12) \quad 3(x+4) = 3(4+x)$$

$$3x + 12 = 12 + 3x$$

$$\begin{array}{r} -12 \quad -12 \\ 3x = 3x \\ -3x \quad -3x \end{array}$$

$0 = 0$  True statement

Identity Equation

13) Three times a number is the same as the difference of twice the number and seven.

Find the number.

$$3x = (2x - 7)$$

$$\begin{array}{r}
 3x = 2x - 7 \\
 -2x \quad -2x \\
 \hline
 x = -7
 \end{array}$$

- 14) Twice the sum of a number and eleven is twenty-two less than three times the number.  
 $3x - 22$   
 Find the number.

$$2(x + 11) = 3x - 22$$

$$\begin{array}{r}
 2x + 22 = 3x - 22 \\
 -3x \quad -3x \\
 -1x + 22 = -22 \\
 -22 \quad -22
 \end{array}$$

$$\begin{array}{r}
 -1x = -44 \\
 \hline
 -1 \quad -1 \\
 x = 44
 \end{array}$$

- 15) The sum of three consecutive even integers is 156, Find the integers.

Example: 8, 10, 12

Consecutive even  $\rightarrow n \quad n+2 \quad n+4$

$$\begin{array}{ccc} \text{1st} & \text{2nd} & \text{3rd} \\ \underline{n} & + \underline{n+2} & + \underline{n+4} = 156 \end{array}$$

$$\begin{array}{r} 3n + 6 \\ - 6 \\ \hline 3n = 150 \end{array}$$

$$\begin{array}{r} 3n = 150 \\ \underline{3} \quad \underline{3} \\ n = 50 \end{array}$$

$$\text{1st} \rightarrow n = \boxed{50}$$

$$\text{2nd} \rightarrow n+2 = 50+2 = \boxed{52}$$

$$\text{3rd} \rightarrow n+4 = 50+4 = \boxed{54}$$

$$\boxed{50, 52, 54} \quad \text{ck: } 50+52+54 = \boxed{156} \checkmark$$

16) Four times the smallest of three consecutive odd integers is 236 more than the sum of the other two integers. Find the integers.

Think Example: 7, 9, 11

Expressions:  $\downarrow$   $\downarrow$   $\downarrow$   
 $n, n+2, n+4$

$$\begin{array}{l} \text{smallest} \qquad \qquad \qquad \text{largest} \\ 4 \cdot n = 236 + (n+2+n+4) \\ 4n = 236 + \underline{n+2} + \underline{n+4} \end{array}$$

$$\begin{aligned}
 4n &= \overset{1st}{236} + \overset{2nd}{n+2} + \overset{3rd}{n+4} \\
 4n &= \cancel{236} + \cancel{2+4} + 2n \\
 4n &= 242 + 2n \\
 -2n &\quad -2n \\
 \hline
 2n &= 242 \\
 \frac{2n}{2} &= \frac{242}{2}
 \end{aligned}$$

$$n = 121 \checkmark \text{ 1st odd integer } n$$

$$n+2 = 121+2 = 123 \text{ 2nd odd integer } n+2$$

$$n+4 = 121+4 = 125 \text{ 3rd odd integer } n+4$$

$$\boxed{121, 123, 125}$$

Solve the equation for the indicated variable. Literal Equation

$$17) 3x + y = -4$$

$$a) \text{ for } x \rightarrow 3x + y = -4 - y$$

$$\frac{-y}{3} = \frac{-4 - y}{3}$$

$$x = \frac{-4 - y}{3}$$

$$b) \text{ for } y \rightarrow 3x + y = -4 - 3x$$

$$\boxed{y = -4 - 3x}$$

$$18) V = \frac{1}{3} b h$$

$$a) \text{ for } h \rightarrow \frac{V}{b} = \frac{\frac{1}{3} \cdot b \cdot \boxed{h}}{b}$$

$$\left(\frac{3}{1}\right) \frac{V}{b} = \frac{1}{3} \cdot \boxed{h} \left(\frac{3}{1}\right)$$

$$\boxed{\frac{3V}{b} = h}$$

$$b) \text{ for } b \rightarrow V = \frac{1}{3} \cdot \boxed{b} \cdot h$$

$$\left(\frac{3}{1}\right) V = \frac{3}{1} \cdot \frac{1}{3} \cdot \boxed{b} \cdot h$$

$$\frac{3V}{h} = \frac{\boxed{b} \cdot h}{h}$$

$$\text{Solving Inequalities } \boxed{\frac{3V}{h} = b}$$

$$19) 2x - 9 \leq 7x + 1$$

$$\begin{array}{rcl} 2x & \leq & 7x + 10 \\ -7x & & -7x \end{array}$$

$$\begin{array}{rcl} -5x & \leq & 10 \\ \underline{-5} & & \underline{-5} \end{array}$$

\* Reverse the inequality sign when multiply

\* by a negative number

$$\frac{-5x}{-5} \leq \frac{10}{-5}$$

$$\boxed{x \geq -2} \quad \text{(a) solve.}$$

$\geq$  or  $\leq$  bracket  
 $>$  or  $<$  ( )'s

(b) Graph.  $x \geq -2$



(c) Interval notation.

$$\boxed{[-2, \infty)}$$

always with ( )'s.

$$20) \quad \begin{array}{ccccc} -4 & \leq & 3x-7 & < & 8 \\ +7 & & +7 & +7 & \end{array}$$

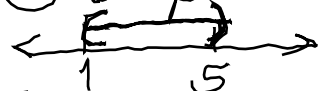
double Ineq,  
→ Add 7 three times

$$\frac{3}{3} \leq \frac{3 \cdot x}{3} < \frac{15}{3}$$

$$\boxed{1 \leq x < 5} \quad \text{(a) solve}$$

$x$  is between 1 inclusive and 5.

(b) Graph:



Interval Notation

$$\boxed{[1, 5)}$$